

Abstract

An apparatus and method to align and assemble a photonic package with sub-micron placement accuracy. The apparatus, or feature, maintains mechanical contact between a first and a second photonic component while the two photonics are aligned and affixed together. The package may comprise the first photonic component having a contact surface and the second photonic component having a partially spherical surface. The contact surface is shaped and fitted to rotatably couple with the partially spherical surface while permitting the partially spherical surface to move in at least three rotational degrees of freedom. The two photonic components are then aligned as desired and affixed together. Certain variations permit motion of the partially spherical surface in three rotational degrees of freedom and one linear degree of freedom. At least one version of the invention includes aligning and assembling an optical fiber with an optical MEMS-based device. In this version, the partially spherical surface of the second component may be coupled with the optical fiber first and makes contact with a contact surface of the MEMS-based device. The optical fiber is then rotated in two degrees of freedom until a desired alignment with the MEMS-based device is achieved. The optical fiber and the MEMS-based device are then affixed by affixing the partially spherical surface and the contact surface together. In one alternate variation the partially spherical surface is shaped to make contact with a contact area of the contact surface. The partially spherical surface maintains connection with at least part of the contact area while the partially spherical surface is rotated in at least two rotational degrees of freedom.